AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

Claim 1 (Cancelled).

2. (Previously Presented) The method of fabricating an X-ray mask according to claim 7, wherein

said laminated X-ray absorber includes a first X-ray absorber opposite said X-ray transmitter and a second X-ray absorber in contact with said first X-ray absorber,

tungsten is employed as one of said first X-ray absorber and said second X-ray absorber, and

diamond is employed as the other of said first X-ray absorber and said second X-ray absorber.

3. (Previously Presented) The method of fabricating an X-ray mask according to claim 7, wherein

said laminated X-ray absorber includes a first X-ray absorber on said X-ray transmitter and a second X-ray absorber on said first X-ray absorber, and

the method of fabricating an X-ray mask further comprises:

forming an etching stopper film, stopping etching when etching said first X-ray absorber on said X-ray transmitter, and

forming said second X-ray absorber on said etching stopper film.

4. (Previously Presented) The method of fabricating an X-ray mask according to claim 7, wherein

said laminated X-ray absorber includes a first X-ray absorber opposite said X-ray transmitter and a second X-ray absorber on said first X-ray absorber, and

the method of fabricating an X-ray mask further comprises:

forming an interlayer film as an etching stopper or a hard mask on said first X-ray absorber, and

forming said second X-ray absorber on said interlayer film.

5. (Previously Presented) The method of fabricating an X-ray mask according to claim 7, wherein said laminated X-ray absorber has a layer containing at least one substance selected from the group consisting of lithium, beryllium, boron, carbon, sodium, magnesium, aluminum, silicon, phosphorus, sulfur, potassium, calcium, scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, gallium, germanium, arsenic, selenium, palladium, silver, cadmium, indium, tin, antimony, tellurium, cesium, barium, mixtures of these elements, a carbide including silicon carbide and tungsten carbide, a nitride including silicon nitride, aluminum nitride, and chromium nitride, an oxide including silicon oxide and chromium oxide, a fluoride, and an iodide.

6. (Previously Presented) The method of fabricating an X-ray mask according to claim 7, wherein said laminated X-ray absorber has a layer containing a substance selected from the group consisting of carbon, titanium, vanadium, chromium, manganese, iron, nickel, copper, zinc, gallium, germanium, arsenic, selenium, palladium, silver, cadmium, indium, tin, antimony, and tellurium.

7. (Previously Presented) A method of fabricating an X-ray mask comprising :

etching an X-ray transmitter at a surface of said X-ray transmitter to form a plurality of recesses extending from the surface and into said X-ray transmitter, leaving portions of the surface between respective parts of recesses; and

forming a laminated X-ray absorber on said surface of said X-ray transmitter, but not in said recesses, wherein said laminated X-ray absorber includes at least two layers having different compositions, wherein phase shift of X-rays transmitted

through said X-ray absorber is in a range of 0.3π to 0.6π and transmittance of the X-rays transmitted through said X-ray absorber is in a range of 30 % to 60 % for X-rays having an average exposure wavelength longer than 0.3 nm and shorter than 0.7 nm.

8. (Previously Presented) The method of fabricating an X-ray mask according to claim 7, further comprising selectively implanting ions into regions of said X-ray transmitter where portions of said X-ray transmitter are to be removed in forming said recesses, before forming said recesses.

9. (Currently Amended) A method of fabricating an X-ray mask comprising:

forming an X-ray transmitter;

forming a first X-ray absorber opposite said X-ray transmitter, said first X-ray absorber including a plurality of spaced apart first X-ray absorber portions, each first X-ray absorber portion having side surfaces substantially transverse to said X-ray transmitter and a first width measured between the side surfaces of said first X-ray absorber portions; and

forming a second X-ray absorber on said first X-ray absorber, said second X-ray absorber comprising a plurality of second X-ray absorber portions spaced from each other, each second X-ray absorber portion being disposed on a corresponding one of the first X-ray absorber portions, each second X-ray absorber portion having side surfaces substantially transverse to said X-ray transmitter and a second width measured between the side surfaces of the second X-ray absorber portions, the second width being larger than the first width and none of the side surfaces of the second X-ray absorber portions being contiguous with the side surfaces of the first X-ray absorber portions.

Claim 10 (Cancelled).

11. (Previously Presented) A method of fabricating a semiconductor device including carrying out an exposure with an X-ray mask having a geometric X-ray phase difference between the phase of X-rays transmitted through an X-ray transmission part of said X-ray mask and the phase of X-rays transmitted through an X-ray absorber of said X-ray mask in a range including 0.5π and proximity to 0.5π, between a resist film located at a position for forming an optical image with said X-rays and said X-ray mask, wherein

said X-ray mask comprises an X-ray transmitter and said X-ray absorber includes a laminated structure having at least two layers on said X-ray transmitter,

said laminated structure includes at least two layers having different compositions, and

either the phase shift of the X-rays transmitted through said X-ray absorber is in a range of 0.3π to 0.6π or the transmittance of the X-rays transmitted through said X-ray absorber is in a range of 30 % to 60 %.

12. (Previously Presented) The method of fabricating a semiconductor device according to claim 11, including carrying out the exposure with an average exposure wavelength of the X-rays longer than 0.3 nm and shorter than 0.7 nm.

13. (Previously Presented) The method of fabricating a semiconductor device according to claim 11, wherein absolute value of difference between the geometric phase difference and the phase shift quantity is in a range including π and proximity to π.

14. (Currently Amended) ~~The~~ A method of fabricating an X-ray mask ~~according to claim 9~~ comprising:

forming an X-ray transmitter;

forming a first X-ray absorber opposite said X-ray transmitter, said first X-ray absorber including a plurality of spaced apart first X-ray absorber portions, each first X-ray absorber portion having a first width; and

forming a second X-ray absorber on said first X-ray absorber, said second X-ray absorber comprising a plurality of second X-ray absorber portions spaced from each other, each second X-ray absorber portion being disposed on a corresponding one of the first X-ray absorber portions, each second X-ray absorber portion having a second width, larger than the first width, wherein

tungsten is employed as one of said first and second X-ray absorbers, and

diamond is employed as the other of said first and second X-ray absorbers.

15. (Currently Amended) ~~The~~ A method of fabricating an X-ray mask ~~according to claim 9, wherein the method of fabricating an X-ray mask further comprises~~ comprising:

forming an X-ray transmitter;

forming a first X-ray absorber opposite said X-ray transmitter;

forming an etching stopper film, stopping etching when etching said first X-ray absorber on said X-ray transmitter, said first X-ray absorber including a plurality of spaced apart first X-ray absorber portions, each first X-ray absorber portion having a first width; and

forming ~~said~~ a second X-ray absorber on said etching stopper film on said first X-ray absorber, said second X-ray absorber comprising a plurality of second X-ray absorber portions spaced from each other, each second X-ray absorber portion being disposed on a corresponding one of the first X-ray absorber portions, each second X-ray absorber portion having a second width, larger than the first width.

16. (Currently Amended) ~~The~~ A method of fabricating an X-ray mask ~~according to claim 9, wherein the method of fabricating an X-ray mask further comprises~~ comprising:

forming an X-ray transmitter;

forming a first X-ray absorber opposite said X-ray transmitter;

forming an interlayer film as an etching stopper or a hard mask on said first X-ray absorber, said first X-ray absorber including a plurality of spaced apart first X-ray absorber portions, each first X-ray absorber portion having a first width; and

forming ~~said~~ a second X-ray absorber on said interlayer film on said first X-ray absorber, said second X-ray absorber comprising a plurality of second X-ray absorber portions spaced from each other, each second X-ray absorber portion being disposed on a corresponding one of the first X-ray absorber portions, each second X-ray absorber portion having a second width, larger than the first width.

17. (Previously Presented) The method of fabricating an X-ray mask according to claim 9, wherein at least one of said first and second X-ray absorbers is selected from the group consisting of lithium, beryllium, boron, carbon, sodium, magnesium, aluminum, silicon, phosphorus, sulfur, potassium, calcium, scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, gallium, germanium, arsenic, selenium, palladium, silver, cadmium, indium, tin, antimony, tellurium, cesium, barium, mixtures of these elements, a carbide including silicon carbide and tungsten carbide, a nitride including silicon nitride, aluminum nitride, and chromium nitride, an oxide including silicon oxide and chromium oxide, a fluoride, and an iodide.

18. (Previously Presented) The method of fabricating an X-ray mask according to claim 9, wherein at least one of said first and second X-ray absorbers is selected from the group consisting of carbon, titanium, vanadium, chromium,

manganese, iron, nickel, copper, zinc, gallium, germanium, arsenic, selenium, palladium, silver, cadmium, indium, tin, antimony, and tellurium.

19. (Previously Presented) The method of fabricating an X-ray mask according to claim 7, including forming said laminated X-ray absorber in a periodic pattern.

20. (Currently Amended) ~~The~~ A method of fabricating an X-ray mask ~~according to claim 9, wherein said~~ comprising:

forming an X-ray transmitter;

forming a first X-ray absorber ~~consists~~ of a first X-ray absorbing material ~~and said~~ opposite said X-ray transmitter, said first X-ray absorber including a plurality of spaced apart first X-ray absorber portions, each first X-ray absorber portion having a first width; and

forming a second X-ray absorber ~~consists~~ of a second X-ray absorbing material, different from said first X-ray absorbing material, on said first-X-ray absorber, said second X-ray absorber comprising a plurality of second X-ray absorber portions spaced from each other, each second X-ray absorber portion being disposed on a corresponding one of the first-X-ray absorber portions, each second X-ray absorber portion having a second width, larger than the first width.